In his book, *The Scientific Image*, as well as in the replies to his critics in *The Images of Science*, Bas C. van Fraassen argues against methodology as traditionally understood from Bacon down to Rudolf Carnap and Karl Popper. He argues that the aim of science is only to be empirically adequate, and nothing more. A theory is empirically adequate if it can account for all the phenomena, past, present, and future, that are in principle observable by us, the epistemic community. The task of the scientist is only to construct an empirically adequate theory, and is not also one of discovering truths about the unobservable. The realist’s attempt to offer more, he thinks, is a failure. He argues that both the local and global properties of theories, like testability, ad hocness, explanatory power, simplicity, elegance, and unity are not truth-indicative, but are merely of pragmatic value. Thus, theory-selection for research and experiment is simply pragmatic; there is no fact of the matter involved. Such is his anti-realist stand.

If van Fraassen is right, then much of the work in methodology is on the wrong track. So I shall provide three counter-arguments. First, I shall argue that van Fraassen’s position is unwarranted even from the limited perspective of his view of the aim of science. For instance, if a theory could account for all the known phenomena – and there is no theory in the history of science that even approximates such a theory – one could not tell that it is empirically adequate. Thus, van Fraassen’s aim of science is no less ideal or utopian than the realist’s aim.

There is a second line of counter-argument. Distinguish between theoretical advice and heuristic advice. The theoretical advice of a methodology determines the best current theory; the heuristic advice determines the best current theory to work on for further research and development. Heuristic advice is indispensable for accounting for the growth of science. But van Fraassen is unable to give any such advice since such advice is purely pragmatic. There is no truth of the matter. One can pick and choose any theory one likes. One group may abandon, say, psychoanalysis and astrology (his examples); another group may pursue them vigorously. What is right (not true), says van Fraassen, depends on one’s purposes, needs, and commitments. This view is in no interesting way distinguish-
able from the old and despised views of Paul Feyerabend, as developed in his infamous book, *Against Method*.

Third, and finally, I recover the major premises in his arguments and in those of his opponents, the realists. This venture enables me to uncover three central postulates in this debate, which I christen the Empiricist’s Postulate, the Rationalist’s Postulate, and the Skeptic’s Postulate. Van Fraassen must adhere to the Empiricist’s Postulate. But he has given no independent argument to show that that postulate in his argument can itself be supported without invoking the anti-realist’s conclusion. Consequently, the anti-realist, I argue, is in a trilemma: either he espouses the Empiricist’s Postulate in which case I show his view to be circular; or he embraces the Rationalist’s Postulate which is alien to his anti-realist philosophy; or, appearance to the contrary, in truth he opts for the Skeptic’s postulate. I conclude: methodology can be saved from at least one anti-realist who is against it.

1. THE IDEAL AIM

This is the anti-realist aim of science: ‘Science aims to give us theories which are empirically adequate; and acceptance of a theory involves as belief only that it is empirically adequate’ (van Fraassen, 1982: 12). This view is called constructive empiricism.

On this view, a scientific theory is not to be defined syntactically but rather semantically, by the class of its models. To say that a theory is empirically adequate is to say that the empirical substructure of at least one model is isomorphic to the phenomena. Simplistically, if what a model of a theory says about the past, present, and future observable world squares exactly with what the actual observable world is like, then the model is empirically adequate. Thus there is a difference between a true theory and one which is merely empirically adequate. If what a theory says about the past, present, and future state of the world squares exactly with what the observable and the unobservable aspects of the world are like, then and only then is the theory true. Hence, a true theory is empirically adequate; but an empirically adequate theory need not be true. Such a view might have pleased Sir Benjamin Collins Brodie. Brodie, the nineteenth century Waynflete Professor of Chemistry at Oxford, railed against those who would use wires and balls for building models of molecules in organic chemistry. At best tools in explaining the observable world, the phenomena, they did not warrant belief in the existence of unobservable entities. Consequently, Brodie developed a system which he called ‘ideal chemistry’, awashed of atoms (Segre, 1980, 7).